

REMARKS

The specification has been amended to overcome the objections by the examiner. It is believed that by the amendments made herein the specification is now clear. The specification was mostly mathematical in nature and the amendments are made to provide a presentation that is clearer and can be more readily understood with respect to the cited references. Applicant points out by the copy where the changes have been made. It is believed that with these amendments the examiner can more clearly appreciate applicant's invention.

The claims are amended to overcome the claim informalities and to present claims clearly patentable over the prior art.

Claims 1 and 3 are rejected under 35 U.S.C. 103 (b) as being anticipated by Gong, Y. and John J, Godfrey, "Transforming HMMs for Speaker-Independent Hands-Free Speech Recognition in the Car", "Proc. Acoustic, Speech, and Sign. Proc., 1999 ICASSP '99, 15-19 March 1999, vol. 1, pp 297-300 (hereinafter Gong and Godfrey).

Claim 2 and 4 are rejected on Gong and Godfrey and Afify, Gong, and Haton, "A Unified Maximum Likelihood Approach to Acoustic Mismatch Compensation :application to noisy Lombard speech recognition.,

" Proc. 1997 IEEE Int Conf. on Acoust., Speech, and Signal Proc., 1997 ICASSP-97, 21-24 April 1997, vol. 2, pp 839-842 (hereinafter Afify et al).

Claims 2-4 are canceled.

Applicant's amended claim 1 calls for:

" A method of hierarchical linear regression to develop a set of linear transforms for

adaptation of an initial set of Hidden Markov Models (HMM) to a new environment comprising the steps of:

providing an initial set of HMM models,

adapting the initial set of models to the new acoustic environment by a procedure comprising the steps of creating an alignment of the adaptation speech data to the HMM model set, then performing the iterative steps of Estimate-Maximize (EM) estimation to generate a local set of linear transforms, merging the local set of linear transforms with a set of prior global transforms to form a new global set of transforms, adapting the initial set of HMM models using the new global set of transforms, and beginning a new EM estimation iteration step to repeat the procedure.

It is not seen where either reference teaches this amended claimed invention. It is not seen where these references teach creating an alignment of the adaptation speech data to the HMM model set, then performing the iterative steps of Estimate-Maximize (EM) estimation to generate a local set of linear transforms, merging the local set of linear transforms with a set of prior global transforms to form a new global set of transforms, adapting the initial set of HMM models using the new global set of transforms, and beginning a new EM estimation iteration step to repeat the procedure.

Claim 5 dependent on Claim 5 is deemed allowable for at least the same reasons as amended Claim 1. Claim 5 further calls for “The method of Claim1 wherein after a number of EM estimation iteration steps the steps of realigning the adaptation speech data with the adapted HMM models wherein parameters can be adjusted to expand the set of linear transforms, performing an EM estimation step to generate a new set local transforms, combining the new local transforms with the prior set of global transforms to

form a new set of global transforms in accordance with the new alignment, and further performing iterative steps of EM estimation.

In view of the above applicant's claim 1, as amended, and added claim 5 are deemed allowable.

Respectfully submitted;



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